

Remarks

Reconsideration of the subject application is requested in view of the preceding amendments and the following remarks. Claims 1-26 are in the application. By this amendment, claims 1, 6-8, 10, 12-14, 18, and 22-23 are amended, claim 21 is cancelled without prejudice, and new claims 27-38 are submitted for consideration. Upon entry of this amendment, claims 1-20 and 22-38 are in the application.

Support for new claims 27-38 and the amendments to claims 1, 6-8, 10, 12-14, 18, and 22-23 can be found in the specification at, for example, page 3, lines 24-27, page 8, lines 11-12, and page 12, lines 16-26. No new matter is introduced.

Rejections of claim 21 are moot in view of the cancellation of claim 21 without prejudice.

Claim Rejections under 35 U.S.C. § 102 in view of McLean

Claims 18-20 and 22-26 stand rejected as allegedly anticipated in view of McLean, XP-002154943 ("McLean"). This rejection is traversed. Claim 18 as amended recites an imaging apparatus comprising an electromagnetic pulse source; a beam splitter splitting a pulse from the electromagnetic pulse source into a first portion and a second portion, the first pulse portion directed toward an object for generating an object image; a microchannel plate detector; and a film of gating material having electromagnetically-induced transparency (EIT) placed in front of the microchannel plate detector to capture the object image in response to the second pulse portion. MacLean does not teach or suggest such an apparatus. In contrast, McLean describes an electronic gate not an EIT film gate as recited in claim 18. According to McLean, a "very low jitter timing pulse" is used to time gating electronics and "the gated pulse is applied via a capacitive coupling scheme which overcomes finite cathode resistivity and large capacitive loading." McLean is silent concerning a film of gating material having electromagnetically-induced transparency. Therefore, claim 18 and dependent claims 19-20 and 22 are allowable over McLean.

Claim 23 as amended recites a method of producing an image comprising generating an electromagnetic pulse; splitting the pulse into a first portion and a second portion; generating an imaging beam in response to the first pulse portion, the imaging beam directed toward an object for generating an object image; and capturing the object image at a microchannel plate detector

using electromagnetically-induced transparency in response to the second pulse portion. As noted above, McLean does not teach or suggest capturing an object image using a film of gating material having electromagnetically-induced transparency, and does not teach or suggest such a film. Therefore claim 23 and dependent claims 24-26 are allowable over McLean.

Claim Rejections under 35 U.S.C. § 103 in View of Alfano and Takahashi

Claims 18-20 and 22-26 stand rejected as allegedly obvious from a combination of Alfano et al., U.S. Patent 5,371, 368 ("Alfano") and Takahashi, U.S. Patent 5,057, 680 ("Takahashi"). This rejection is traversed. Claim 18 as amended recites, *inter alia*, a film of gating material of electromagnetically-induced transparency placed in front of the microchannel plate detector to capture the object image in response to the second pulse portion. Alfano teaches a CCD camera configured capture an image gated by a Kerr cell. Takahashi discloses a microchannel plate (MCP) that is controlled by an electrical pulse applied through stripline electrodes. Because neither Alfano nor Takahashi teaches or suggests such a film of gating material, claim 18 and dependent claims 19-20 and 22 are properly allowable over any combination of Alfano and Takahashi.

Claim 23 as amended recites, *inter alia*, capturing an object image at a microchannel plate detector using electromagnetically-induced transparency in response to a second pulse portion. As noted above, neither Alfano nor Takahashi provides any teaching concerning electromagnetically-induced transparency or capturing an image using such transparency. Therefore, claim 23 and dependent claims 24-26 are properly allowable over any combination of Alfano and Takahashi.

Rejections under 35 U.S.C § 103 in View of Alfano and Hirose

Claims 1, 2, 4, 5, 7 and 10-15 stand rejected as allegedly obvious from a combination of Alfano and Hirose et al., U.S. Patent 5,680, 429 ("Hirose"). This rejection is traversed. Claim 1 as amended recites an imaging apparatus that includes an electromagnetic pulse source; a beam splitter splitting a pulse from the electromagnetic pulse source into a first portion and a second portion; an X-ray source generating a beam in response to the first pulse portion, the beam directed toward an object for generating an X-ray object image; and an X-ray time gate capturing the X-ray object image in response to the second pulse portion. No combination of Alfano and

Hirose teaches or suggests such an apparatus. Hirose teaches an X-ray imaging apparatus, but does not teach or suggest an X-ray time gate of any kind. Alfano fails to cure the deficiency of Hirose. Alfano discloses a system in which a probing laser that emits radiation at a wavelength of 1054 nm is gated by a Kerr cell, but Alfano does not teach or suggest an X-ray time gate as recited in claim 1. Because neither Alfano nor Hirose teaches or suggests an X-ray time gate configured to capture an X-ray object image, claim 1 and dependent claims 2-9 are properly allowable over any combination of Alfano and Hirose.

Claim 10 recites a method for producing an image of an object that comprises generating an electromagnetic pulse; splitting the pulse into a first portion and a second portion; generating an X-ray beam in response to the first pulse portion, the beam directed toward an object for generating an X-ray object image; and selectively transmitting the X-ray object image in response to the second pulse portion. No combination of Alfano and Hirose teaches or suggests such a method. As noted above, neither Alfano nor Hirose teaches or suggests selectively transmitting an X-ray object image in response to a second pulse portion of an electromagnetic pulse. Hirose is silent concerning such selective transmission of an X-ray object image, and Alfano teaches only a conventional Kerr cell gate configured to transmit an image based on 1054 nm radiation. Therefore, claim 10 and dependent claims 11-16 are properly allowable over any combination of Alfano and Hirose.

Additional Rejections under 35 U.S.C § 103

Claim 3 stands rejected as allegedly obvious from a combination of Alfano, Hirose, and Biswal, U.S. Patent 5,757, 859 ("Biswal"). This rejection is traversed. Claim 3 depends from allowable independent claim 1 and is therefore allowable.

Claim 6 stands rejected as allegedly obvious from a combination of Alfano, Hirose, and Takahashi. This rejection is traversed. Claim 6 depends from allowable claim 1 and is therefore allowable. Claim 6 as amended recites an apparatus that includes a time gate comprising a film having electromagnetically-induced transparency. No combination of Alfano, Hirose, and Takahashi teaches or suggests such a film, and claim 6 is therefore properly allowable.

Claims 8-9 stand rejected as allegedly obvious from a combination of Alfano, Hirose, and Duncan et al., "Time-gated imaging through scattering media using stimulated Raman amplification," Opt. Lett. 16:1868-1870 (1991) ("Duncan"). This rejection is traversed. Claims

8-9 depend from allowable claim 1 and are therefore allowable. Duncan does not teach or suggest an X-ray time gate configured to capture an X-ray image in response to a second pulse portion, and fails to cure the deficiencies of Alfano and Hirose. Therefore, claims 8-9 are properly allowable over any combination of Alfano, Hirose, and Duncan.

Claims 16-17 stand rejected under as allegedly obvious from a combination of Alfano, Hirose, and Klaveness et al., U.S. Patent 6,159, 445 (“Klaveness”). This rejection is traversed. As noted above, neither Alfano nor Hirose teaches or suggests selectively transmitting an X-ray object image in response to a second pulse portion of an electromagnetic pulse. Klaveness fails to cure the deficiencies of Alfano and Hirose. Klaveness teaches contrast agents but does not teach or suggest selectively transmitting an X-ray object image in response to a second pulse portion of an electromagnetic pulse. Therefore, claims 16-17 are properly allowable over any combination of Alfano, Hirose, and Klaveness.

New Claims

By this amendment, new claims 27-38 are submitted for consideration. These claims recite features and combinations of features that are neither taught nor suggested by Alfano, Takahashi, McLean, Biswal, Klaveness, and Duncan. New claims 27-32 recite X-ray radar apparatus for generating and capturing reflective X-ray object images. Claims 33-38 recite methods for examining an object using an X-ray by generating reflective X-ray object images and capturing the reflective X-ray object images associated with a selected object depth using an X-ray time gate in response to a second pulse portion. Such apparatus and methods are not taught or suggested by any of the above references.

Conclusion

All pending claims are in condition for allowance. The Examiner is invited to contact the undersigned attorney at the telephone number listed below if such a call would in any way facilitate allowance of this application.

Respectfully submitted,

KLARQUIST SPARKMAN, LLP

By



Michael D. Jones
Registration No. 41,879

One World Trade Center, Suite 1600
121 S.W. Salmon Street
Portland, Oregon 97204
Telephone: (503) 226-7391
Facsimile: (503) 228-9446